HW4 Report

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Task2-1

1. Model results

```
ComplEx:
MRR: 0.42
Hits@10: 0.55
Hits@3: 0.43
Hits@1: 0.35
```

```
TransE:
MRR: 0.25
Hits@10: 0.38
Hits@3: 0.29
Hits@1: 0.17
```

```
DistMult:
MRR: 0.40
Hits@10: 0.52
Hits@3: 0.43
Hits@1: 0.33
```

2. Explain

   Q1: How do they get ranks for the certain triple? Please explain step by step.

   Answer:

   The **ranks** returned by the evaluate_performance function indicate the rank at which the test set triple was found when performing link prediction using the model.

   1. Artificially generate negative triples by corrupting first the subject and then the object.
   2. Remove the positive triples from the set returned by (1) – positive triples are usually the concatenation of training, validation and test sets.
   3. Rank each test triple against all remaining triples returned by (2).

   Q2: What should be ***ranks*** (in this tutorial) if the model got 100% correct answers?

   Answer: **1**

Task2-1

2.a.Q1:

```
ComplEx:  BRANCH_OF
TransE:  SPOUSE
DistMult:  ALLIED_WITH
```

Task2-3

1.result of models

```
ComplEx:  [['Arya Stark' 'Rickon Stark' 'Skittrick' 'Donnis' 'TomToo']]
TransE:  [['Arya Stark' 'Skittrick' 'Nan' 'Porther' 'Edwyn Stark']]
DistMult:  [['Arya Stark' 'Rickon Stark' 'Farlen' 'TomToo' 'Porther']]
```

Task3-1

The number of overlaps: **15**

```
num = 0
lst1 = list(pagerank_top20.node1)
lst2 = list(indegree_top20.node1)
for i in lst1:
    if i in lst2:
        num += 1
print('The number of overlaps:', num)
```

```
The number of overlaps: 15
```

Task3-2

Number of allies of *House Lannister of Casterly Rock:* **78**